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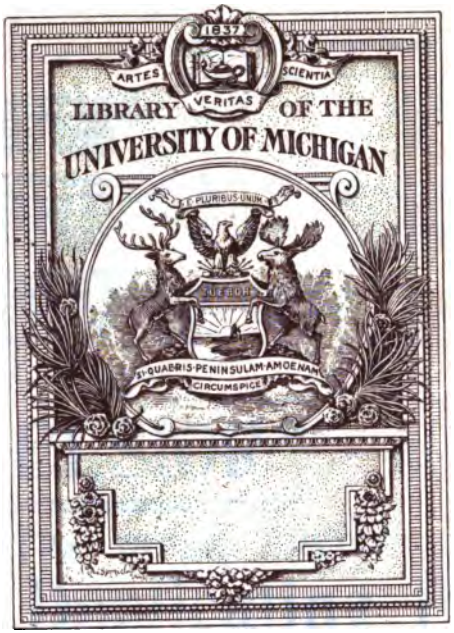

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34 Moorgate Street,
London, E.C.
June 1903.

CONTENTS.

PAGE

EDITOR'S PREFACE .. .. v.

AUTHOR'S NOTE .. .. xi.

CHAPTER I.

STANDARDISATION OF ACCOUNTS.—Form adopted by Municipal Tramways Association of Great Britain and Institute of Municipal Treasurers and Accountants (Incorporated) — Suggested Universal Standard form of Accounts 1-17

CHAPTER II.

DISADVANTAGES OF EXPENDITURE LEDGER SYSTEM 18-19

CHAPTER III.

NUMERICAL LIST OF ACCOUNTS. — Printed Lists of Account Numbers required for use of Employees — Requisitioning Stores—Workshops Costs of Articles Manufactured for Store 20-23

CHAPTER IV.

ALLOCATION OF WAGES.—Fortnightly Time Allocation Returns—Method of Using—Tabulations for providing Allocated Figures for Wages for Four-weekly Expenditure Statements and Quarterly or Half-yearly Journal entries 24-25

CHAPTER V.

ALLOCATION OF MATERIALS.—Charging Issues from Stores direct to ultimate Accounts—Combined Stores Requisition and Receipt—Priced and Extended Stock Accounts—Stores Issues Sheets—Returns to Stores—Stores Allocation and Balance Sheet — Tabulations for providing Allocated Figures for Material for Four-weekly Expenditure Statements and Quarterly or Half-yearly Journal entries—Stock Sheets .. 26-29

CHAPTER VI.

CONCLUSION.—Special Statistical items suggested 30-33

LIST OF FORMS 34

FACSIMILES OF BOOKS AND FORMS 35-42

INDEX 43

AUTHOR'S NOTE.

THE main object of this brief supplement to "Tramway Bookkeeping and Accounts" (Volume XV. of "The Accountants' Library") is to indicate some improvements which the Author was led to make whilst organising, in a foreign city, a system of tramway accounting, adapted to local conditions, and sufficiently simple to be easily carried out by a native staff.

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DONALD McCOLL.

1 The Avenue,
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TRAMWAY BOOKKEEPING AND ACCOUNTS SIMPLIFIED.

CHAPTER I.

STANDARDISATION OF ACCOUNTS.

THE first chapter of "Tramway Bookkeeping and Accounts" dealt with, and suggested a form for, the standardisation of Tramway Accounts. To the Municipal Tramways Association of Great Britain and the Institute of Municipal Treasurers and Accountants (Incorporated) belong the credit of adopting a form for municipal tramway undertakings. A preliminary form had been drawn up by Mr. James Dalrymple (now General Manager, Glasgow Corporation Tramways), who wisely kept in view the importance of making comparisons possible with American systems.

The following form was finally approved by both bodies, and in accordance with it the majority of local authorities owning and operating tramways now make up their accounts. The results of this uniformity are of inestimable value in the operation of tramways.

Dr. REVENUE ACCOUNT for Year from to *Cr.*

Expenditure.	Aver'ge per Car Mile	£ s d	£ s d	*Income.*	Aver'ge per Car Mile	£ s d
	D.				D.	
To TRAFFIC EXPENSES:—				By TRAFFIC REVENUE		
1. Superintendence				" SUNDRY REVENUE:—		
2. Wages of Motormen and Conductors				Advertising on Cars		
3. Wages of other Traffic Employees						
4. Cleaning and Oiling Cars						
5. Cleaning, Salting, and Sanding Track						
6. Fuel, Light, and Water for Depôts						
7. Ticket Check, including Wages of Inspectors and Clerks						
8. Uniforms and Badges						
9. Miscellaneous						
" GENERAL EXPENSES:—						
10. Salaries of General Officers and Staff						
11. Store Expenses						
12. Rents						
13. Rates and Taxes						
14. Printing and Stationery						
15. Fuel, Light, and Water for Offices						
16. Law Charges						
17. Accident Insurances and Compensations						
18. Fire and other Insurances						
19. Miscellaneous						
" GENERAL REPAIRS AND MAINTENANCE:—						
20. Permanent Way						
21. Electrical Equipment of Line ..						
22. Buildings and Fixtures						
23. Workshop Tools and Sundry Plant						
24. Cars						
25. Other Rolling Stock						
26. Miscellaneous Equipment						
" *POWER EXPENSES:—						
27. Cost of Current at.....d. per Board of Trade Unit						
Total Amount of Working Expenses..						
Balance, carried to Net Revenue Account, p. 3						

*Where there is a separate tramway power station an abstract of the total expenses should be shown in the form provided on p. 7.

Dr. NET REVENUE ACCOUNT for Year from to *Cr.*

	Average per Car Mile	£ s d		Average per Car Mile	£ s d
	D.			D.	
To INTEREST ON CAPITAL (including Tax) ..			By Balance from Revenue Account, p. 2 ..		
" INCOME TAX ON PROFITS			" BANK INTEREST (*less* Interest charged) ..		
" BANK INTEREST (*less* Interest received) ..					
" RENT OF LEASED LINES					
" Balance carried to Appropriation Account					

Dr. APPROPRIATION ACCOUNT for Year from to *Cr.*

	Average per Car Mile	£ s d	£ s d		Average per Car Mile	£ s d
	D.				D.	
To Amounts appropriated for:—				By Net Revenue for the Year brought down ..		
Repayment of Mortgage Loans						
Contributions to Sinking Fund						
Reserve or Renewals Fund ..						
.....						
.....						
.....						
" Amounts otherwise appropriated, viz.:—						
Transferred to.....Fund						
in aid of Rates						
.....						
.....						
.....						

Dr. RESERVE OR RENEWALS FUND ACCOUNT for Year from to *Cr.*

	£ s d	£ s d		£ s d
To Appropriation for Renewal of :—			By Balance brought forward	
.....			" Dividends on Investments	
.....			" APPROPRIATION ACCOUNT :—	
.....			Amount set aside for Renewals	
" Balance carried to Balance Sheet				

Dr. SINKING FUND ACCOUNT for Year from to *Cr.*

	£ s d		£ s d
To Balance carried to Balance Sheet		By Balance brought forward	
		" Dividends on Investments	
		" APPROPRIATION ACCOUNT :—	
		Contributions during the year	

Dr. CAPITAL ACCOUNT, Year ended..... *Cr.*

Expenditure.	To 31st March 190..	From 1st April 190....to 31st March 190....	Total	*Income*	To 31st March 190....	From 1st April 190....to 31st March 190....	Total
	£ s d	£ s d	£ s d		£ s d	£ s d	£ s d
To Permanent Way				By Loans Raised (*less* Loans Redeemed), viz.:—			
" Electrical Equipment of Line				.....			
" Land				.....			
" Buildings and Fixtures ..				.....			
" *Power Station and Sub-Stations Plant				" Loans Redeemed			
" Workshop Tools and Sundry Plant				" Revenue Contribution to Capital Outlay			
" Cars (including Electrical Equipment of Cars) ..							
" Other Rolling Stock ..							
" Miscellaneous Equipment							
" Office Furniture							
" Parliamentary Expenses..							
" Preliminary Expenses ..							

*This item applies only to systems having a separate tramway power station.

BALANCE SHEET as at.....

Liabilities.	£ s d	£ s d
LOANS :—		
Stock		
Mortgages		
REDEMPTION OF DEBT :—		
Amount of Mortgage Loans repaid ..		
SINKING FUND		
RESERVE OR RENEWALS FUND..		
SUNDRY CREDITORS		

Property, Assets, and Outlay.	Expenditure To....190 £ s d	Expenditure During Year £ s d	Total £ s d
COST OF EXISTING WORKS, &c.:—			
Permanent Way			
Electrical Equipment of Line			
Land			
Buildings and Fixtures ..			
* Power Station and Sub-Stations Plant			
Workshop Tools and Sundry Plant			
Cars (including Electrical Equipment of Cars) ..			
Other Rolling Stock			
Miscellaneous Equipment ..			
Office Furniture			
Parliamentary Expenses ..			
Preliminary Expenses ..			
INVESTMENTS :—			
.....			
.....			
.....			
STORES :—			
.....			
.....			
.....			
SUNDRY DEBTORS..			
UNEXPIRED LICENCES			
CASH			

* This item applies only to systems having a separate tramway power station.

ABSTRACT OF POWER EXPENSES.

	Average per K.W. Hour	Average per Car Mile	£ s d
27 Salaries and Wages			
28 Fuel			
29 Water			
30 Oil and Waste			
31 Miscellaneous Supplies			
32 Repairs to Steam Plant			
33 " " Electrical Plant			
34 " " Ducts, Feeder Cables, &c.			
35 " " Power and Sub-Station Buildings			
Proportion of Rents, Rates, and Taxes			
" " Insurance Premiums			
" " General Management			
Amount laid aside to meet Depreciation and Renewal ..			
Interest on Capital, £.....at £.....% ..			
Sinking Fund			

STATISTICAL INFORMATION.

Total Borrowing Powers .. .. £
Borrowing Powers exercised .. .. £
Unexhausted Borrowing Powers .. .. £
Gross Capital Expenditure .. .. £
Mileage of Track :—

	SINGLE			DOUBLE			TOTAL		
	Miles	Fur.	Yds.	Miles	Fur.	Yds.	Miles	Fur.	Yds.
Owned									
Leased									
Totals									

Population served by Tramways .. ..
Traffic Revenue .. .. £
Total Revenue .. .. £
Working Expenses .. .. £
Interest on Capital .. .. £
Sinking Fund .. .. £
Net Balance .. .. £
Disposal of Net Balance

Car Miles .. ..
Passengers carried .. ..
Total Number of Units used .. ..
Number of Units used per Car Mile .. ..
Average Number of Cars in use for hour day .. ..
Percentage of Working Expenses to Receipts .. .. ..
Average Traffic Revenue per car mile .. ..
Average Traffic Revenue per mile of single track .. ..
Average Total Revenue per car mile .. .. ..
Average Car Miles per day per car .. ..
Average speed per hour .. ..
Average Car Hours per day .. ..
Average Working Expenses per car mile, excluding Power Cost
Average Working Expenses per car mile, including total Power Cost, as detailed on page 7 .. ..
Scale of Fares :—

	½d.	1d.	1½d.	2d.	2½d.	3d.	3½d.	Average Fare charged per mile
Average distance (miles)								

Average Fare paid per Passenger .. ..
Average Number of Passengers per car mile .. .. ..
Average Journeys per head of population per annum .. ..
Number of Cars in stock .. ..
Total Amount of Sinking Fund .. .. £
Amount of Sinking Fund applied in reduction of debt .. £
Amount of Reserve or Renewals Fund .. .. £

REVENUE ACCOUNT.

CLASSIFICATION OF WORKING EXPENSE ACCOUNTS.

Traffic Expenses.—

ACCOUNT No. 1.

Superintendence.

Charge to this account salary of traffic superintendent and assistants.

ACCOUNT No. 2.

Wages of Motormen and Conductors.

Charge to this account wages of motormen and conductors engaged in operation of cars.

ACCOUNT No. 3.

Wages of other Traffic Employees.

Charge to this account wages of depôt clerks, traffic regulators trolley, turners, points boys, &c.

ACCOUNT No. 4.

Cleaning and Oiling Cars.

Charge to this account wages paid to car cleaners and oilers, and cost of all cleaning material, brooms, brushes, buckets, chamois skins, dusters, mops, polish, soap, sponges, waste, disinfectants, water, oil, grease, &c.

ACCOUNT No. 5.

Cleaning, Salting, and Sanding Track.

Charge to this account wages of men employed in cleaning, salting, and sanding track, cost of tools for cleaning track, salt and sand.

ACCOUNT No. 6.

Fuel, Power, Light, and Water for Depôts.

Charge to this account cost of fuel for depôt offices, cost of lighting depôts, and water, other than water for cleaning cars.

ACCOUNT No. 7.

Ticket Check.

Charge to this account cost of tickets, conductors' punches, wages of ticket inspectors, clerks in punch and ticket office, and deduct the receipts from advertisements on back of tickets.

ACCOUNT No. 8.

Uniforms and Badges.

Charge to this account cost of uniforms and badges supplied to traffic staff.

ACCOUNT No. 9.

Miscellaneous.

Charge to this account cost of Inland Revenue and Police Licenses for cars.

General Expenses.—

ACCOUNT No. 10.

Salaries of General Officers and Staff.

Charge to this account salaries of general manager, accountant, auditors, and all officers and clerks not engaged exclusively in any one department.

ACCOUNT No. 11.

Store Expenses.

Charge to this account all salaries and expenses in connection with store room including wages of vanmen conveying supplies from general store to depôts and collecting scrap.

ACCOUNT No. 12.

Rents.

Charge to this account rental of head offices, sub-offices, and way-leaves.

ACCOUNT No. 13.

Rates and Taxes.

Charge to this account all local rates and taxes including municipal rates, police rates, poor and school rates, &c., on the annual value of the tramways undertaking.

ACCOUNT No. 14.

Printing and Stationery.

Charge to this account all expenditure for printing and stationery supplies.

The cost of tickets should be charged to Account No. 7.

ACCOUNT No. 15.

Fuel, Light, and Water for Offices.

Charge to this account cost of coal and other fuel for head office and sub-offices, also cost of electric light, gas, and water for same.

ACCOUNT No. 16.

Law Charges.

Charge to this account all legal expenses except those incurred in connection with damage claims.

ACCOUNT No. 17.

Accident Insurances and Compensations.

Charge to this account the annual premium on Third Party and Employers Liability policies, or if claims are settled by the department the amount of claims paid and the legal expenses connected therewith.

ACCOUNT No. 18.

Fire and Other Insurances.

Charge to this account the annual fire, boiler, and other insurance premiums.

ACCOUNT No. 19.

Miscellaneous.

Charge to this account any other sundry expenses not included in any of the foregoing accounts, including repairs to office furniture.

General Repairs and Maintenance.—

ACCOUNT No. 20.

Permanent Way.

Charge to this account all expenditure for repair and maintenance of track and roadway, of tracks in yards, depôts, and other buildings, including wages, material, tools, fuel, light, water, freight, cartage, and other expenses in connection with this work.

The cost of preparing rails for repair of bonding, and of removing and relaying paving, &c., for repair of electrical equipment of line should be charged to Account No. 21.

The expenses of the permanent way yard, including wages of yardmen, would be distributed over the accounts benefited.

ACCOUNT No. 21.

Electrical Equipment of Line.

Charge to this account all expenditure for repair of overhead, conduit, or surface contact electric line, including wages, material, and tools employed or used in taking up, re-setting and re-painting poles, taking down trolley, feed, guard, and supplementary wires and substituting new, repairing rail bonding, removing and relaying paving for repairs of the electric line, repairs to ducts and cables, section boxes, &c.

The cost of repairs of electric line in yards and depôts should be charged to this account.

ACCOUNT No. 22.

Buildings and Fixtures.

Charge to this account all expenditure for repair of buildings and fixtures used in connection with the operation of the tramways, including

wages, material, tools, freight, cartage of materials, and all other expenses connected with this work.

The term "buildings and fixtures" includes workshops, office buildings, waiting rooms, car sheds, stables, stores, &c., and all fixtures, including gas pipes, water pipes, drains, heating apparatus, lighting fittings.

The cost of repair of power station and sub-station buildings should be charged to Account No. 35.

The cost of repair of tracks in yards, car sheds, and other buildings, should be charged to Account No. 20.

The cost of repairs of electric lines in yards, car sheds, and other buildings, should be charged to Account No. 21.

Account No. 23.

Workshop Tools and Sundry Plant.

Charge to this account all expenditure for repair of workshop tools, machinery, and appliances, such as engines, boilers, shafting, motors, &c.

Hand tools of tradesmen should be charged to the account benefited by their use.

Account No. 24.

Cars (including Electrical Equipment of Cars).

Charge to this account all expenditure for repair of cars, and electrical equipment of same, including wages, material, tools, freight, cartage of material, and all other expenses connected with this work.

The term "Cars" includes car bodies, trucks, motors, and controllers, and all fixtures or appliances inside of or attached to these parts.

The cost of incandescent lamps, bell cord, trolley rope, commutator brushes, tools for motormen, &c., should be charged to this account.

Account No. 25.

Other Rolling Stock.

Charge to this account all expenditure for repair of sundry vehicles, including water cars or carts, sand and salt cars or carts, store carts, snow ploughs, sweepers, lorries, vans, broughams, &c., including wages, material, tools, freight, cartage of material, and all other expenses connected with this work. All vehicles used exclusively for work included under any of the foregoing accounts should be charged directly to the account benefited.

Account No. 26.

Miscellaneous Equipment.

Charge to this account all expenditure for repair of harness and cost of replacing horses, not otherwise directly charged.

Power Expenses.—

ACCOUNT No. 27.

Charge to this account cost of power at a price per unit.

OR

* ACCOUNT No. 27.

Salaries and Wages.

Charge to this account proportion of chief engineer's salary, and all wages in the power station and sub-stations, except wages of men engaged in repairing plant. This account should include wages to the following employees:—Superintendent of station, engineers, greasers, feed pump attendants, stokers, coal and ash attendants, electrical engineers, switchboard attendants, motor attendants, basement attendants, cranemen, cleaners, boiler fitters, clerks and storemen, watchmen, sub-station attendants, sub-station improvers, sub-station cleaners.

* ACCOUNT No. 28.

Fuel.

Charge to this account all expenditure for coal or other fuel used at the power station, including freight, cartage, and removal of ashes.

* ACCOUNT No. 29.

Water.

Charge to this account cost of water for boilers and condensers.

* ACCOUNT No. 30.

Oil and Waste.

Charge to this account all expenditure for lubrication of power plant and sub-station plant, including oil, grease, waste, rags, &c.

* ACCOUNT No. 31.

Miscellaneous Supplies.

Charge to this account all sundry expenditure in the operation of the power station and sub-stations not detailed under the foregoing accounts. Material used in repairs should not be charged to this account.

The following is a list of some of the items chargeable to this account:—Globe metal polish, emery and glass paper, brushes and mops, oil cans and spouts, soaps and sodas, tallow, turpentine, graphite, sternoline grease, pumice stone, ground black lead, bath bricks, chalk, squeegees, toilet rolls, twines.

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* These items only apply to systems having a separate tramway power station.

* Account No. 32.

Repairs to Steam Plant.

Charge to this account all expenditure for wages, material, tools freight, cartage of material, and all other expenses in connection with repair of steam plant, including engines and engine parts, appliances, and fixtures, belts, belt tighteners and fixtures, receivers, lubricators and oiling devices, boilers, furnaces, economisers, pumps, feed water heaters, tanks, condensers, coal and ash conveyors, mechanical stokers, and other boiler room appliances, piping and steam fitting, including valves, separators, water connections, and water meters.

* Account No. 33.

Repairs to Electrical Plant.

Charge to this account all expenditure for wages, material, tools, freight, cartage of material, and other expenses in connection with repair of electrical plant, including generators, switchboards, cable and feeder terminals, storage batteries, transformers, rotaries, boosters, rheostats, circuit breakers, ammeters, and other electrical equipment.

Commutator brushes for generators should be charged to Account No. 31.

* Account No. 34.

Repairs to Ducts, Cables, &c.

Charge to this account all expenditure for wages, material, tools, freight, cartage of material, and other expenses in connection with repair of ducts for cables, manholes, cables, and other electrical plant, which expense, when the power is purchased, is included in the price of the current.

* Account No. 35.

Charge to this account all expenditure for repair of power station and sub-stations buildings, including wages, material, tools, freight, cartage of materials, and all other expenses connected with this work.

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* These items only apply to systems having a separate tramway power station.

CAPITAL ACCOUNT.

CLASSIFICATION OF CAPITAL ACCOUNTS.

PERMANENT WAY.
ELECTRICAL EQUIPMENT OF LINE.
LAND.
BUILDINGS AND FIXTURES.
*POWER STATION AND SUB-STATION PLANT.
WORKSHOP TOOLS AND SUNDRY PLANT.
CARS (including Electrical Equipment of Cars).
OTHER ROLLING STOCK.
MISCELLANEOUS EQUIPMENT.
OFFICE FURNITURE.
PARLIAMENTARY EXPENSES.
PRELIMINARY EXPENSES.

Expenditure.—

Permanent Way.

Charge to this account all expenditure for track and roadway construction, including labour, materials, tools, freight, cartage, cost of grading, excavating, track laying, ties, yokes, slot rails, sewer manhole frames and covers, rails, rail fastenings, welded joints, special work (including crossings, crossovers, curves, frogs, guard rails, switches), concrete, paving, oils, pitch, gravel, chips, asphalte, bitumen, drain boxes, sewer boxes, F.C. traps, gratings, C.I. pipes, F.C. pipes, iron paving blocks, bricks, bolts and nuts, coal, cement, dog spikes, road metal, sand, spelter, F.C. syphons, lifting wood, fences, bridges, culverts, trestles, subways, tunnels, &c., engineering and superintendence, wages of clerks, timekeepers, watchmen, light and water, street improvements, and other expenses not detailed above.

The cost of tracks in car depôts and other buildings should be charged to this account.

The cost of preparing rails for bonding should be charged to Electrical Equipment of Line Account.

Electrical Equipment of Line.

Charge to this account all expenditure for electrical equipment of line ncluding labour, materials, tools, freight, cartage, cost of preparing rails for bonding, rail bonds, *ducts, *manholes, poles, rosettes, *cables, guard wire, span wire, strain wire, supplementary wire, trolley wire, *ground feeders, *underground feeders, pole fixtures, overhead appliances, conduit appliances, surface contact appliances, engineering and superintendence, wages of clerks and timekeepers, and other expenses not detailed above.

* These items only apply to systems having a separate tramway power station.

Land.

Charge to this account cost of ground purchased for workshops, car sheds, offices, and other buildings used in operation of line.

Ground purchased to form tramway track should be charged to Permanent Way Account.

Buildings and Fixtures.

Charge to this account all expenditure for buildings and fixtures, including labour, materials, tools, freight, cartage, and all other expenses incidental to the work.

"Buildings and Fixtures" includes car sheds, * power station, * sub-stations, workshops, stores, stables, offices, waiting rooms, &c.

** Power Station and Sub-Station Plant.*

Charge to this account all expenditure for steam and electrical equipment of power station and sub-stations, including foundations for equipment.

The cost of buildings used for power station and sub-stations should be charged to Buildings and Fixtures Account.

Workshop Tools and Sundry Plant.

Charge to this account all expenditure for shop tools and workshop machinery, car shed tools, granary machinery, permanent way plant, sand drying plant, and other appliances, including foundations for same.

Cars (including Electrical Equipment of Cars).

Charge to this account all expenditure in the construction of cars from the operation of which revenue is derived.

The term "car" includes the car body, truck, motors, and controllers, and all fixtures or appliances inside of or attached to these parts.

Other Rolling Stock.

Charge to this account cost of sundry vehicles, including water cars or carts, sand and salt cars or carts, store cars, snow ploughs, sweepers, lorries, vans, broughams, &c.

Miscellaneous Equipment.

Charge to this account cost of horses, harness, uniforms, cash boxes, ticket boxes, bell punches, &c.

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*These items only apply to systems having a separate tramway power station.

Office Furniture.

Charge to this account cost of furniture for head office, sub-offices, &c.

Parliamentary Expenses

Charge to this account costs of Acts of Parliament promoted by the Corporation for tramway purposes.

Preliminary Expenses.

Charge to this account all preliminary organising expenses not chargeable under any of the foregoing accounts.

Income.—

Credit all loans raised or repaid, also amount provided for redemption of loans, as well as any contribution by revenue to capital expenditure.

In a *universal* standard form of Tramway Accounts (towards which all interested bodies could co-operate) the separation of Wages from Materials and other expenses would obviously be desirable, as well as sufficient statistical detail to enable comparisons to be made with due regard to differences in conditions. In this connection special attention is directed to the list of special statistical items on pp. 31-32.

CHAPTER II.

DISADVANTAGES OF EXPENDITURE LEDGER SYSTEM.

THERE is generally more difficulty in dealing with the allocation of wages and materials up to the point of completing the figures for use in periodical statements of receipts and expenditure, and for transmission into the general books, than in connection with the general books themselves. The bookkeeping of most businesses, so far as the general books are concerned, is more or less uniform in principle and practice; it is in concerns which employ a large number of men and use a great quantity and variety of material that there is more work and more scope for saving work in what leads up to the general books, and in planning a tight and direct system without superfluity or repetition.

While the general books present little difficulty in themselves, they are apt to do so, especially at balance time, owing to disagreements between the Expenditure Ledgers and Stock Sheets for the different departments with the respective accounts in the General Ledger. The main disadvantages of the system of Expenditure Ledgers (Forms 40, 50, 65, and 70 in "Tramway Bookkeeping and Accounts") are (1) the work they entail, and (2) the absence of frequent automatic balancing. Also, with the Expenditure Ledger system material may be requisitioned

and charged from general stores to a General Account (Departmental), and afterwards re-requisitioned and re-charged from that Departmental Account (with the risk of error in description, quantity, or price in the process) before reaching the Expenditure Ledger.

Although there is no such redundant treatment in connection with Wages, there is, as in the case of Material, a want of *inevitableness* that the aggregate amount distributed throughout all the accounts in the Expenditure Ledger will agree with the amount which appears at the debit of that particular Departmental Account in the General Ledger. And this notwithstanding that, after all amounts chargeable to each account have been posted into the Expenditure Ledger, the accounts therein have all got to be summed up and the totals abstracted before any balancing can be attempted.

The foregoing does not mean any more than that of two systems which are both *right* the one now recommended is to be preferred, because—

(1) It saves work.

(2) It is simpler and easier.

(3) It ensures absolute and frequent agreement.

CHAPTER III.

NUMERICAL LIST OF ACCOUNTS.

On pages 12-17 of "Tramway Bookkeeping and Accounts" a comprehensive numerical list of all Ledger and Subsidiary Accounts is given. The necessity, however, is very great to have, in the hands of each employee who has anything to do with allocation of time or material, a printed list *of such accounts as are required for this purpose.* The following is an example of what is meant:—

ELECTRIC CAR MAINTENANCE ACCOUNTS.

No. of Account	Title of Account
	MECHANICAL.
*1	Car body, closed single truck cars.
*2	Car body, open single truck cars.
*3	Car body, open double truck cars.
4	Gates.
5	Curtains.
6	Gongs.
7	Signal bells.
8	Drawbars and couplings.
9	Dashes.
10	Hand brake gear and shoes.
11	Track brake.
12	Hunter signs.
†13	Truck frames, single truck cars.
†14	Truck frames, double truck cars.
15	Axles, single truck cars.
16	Axles, double truck cars.
17	Axle boxes and bearings, single truck cars.
18	Axle boxes and bearings, double truck cars.
19	Wheels, single truck cars.
20	Wheels, double truck cars.
21	Fenders.
22	Sand gear.
23	Painting cars.
24	Miscellaneous, including car accessories.

* Including all parts not specified in following accounts.
† Including everything in connection with trucks except axles, wheels, axle boxes and bearings.

ELECTRIC CAR MAINTENANCE ACCOUNTS—*continued.*

No. of Account	Title of Account
	ELECTRICAL.
25	Trolley wheels, bases, and poles.
26	Motor wiring.
27	Lighting circuit.
28	Circuit breaker and fuse box.
29	Rheostats and lightning arrestor.
30	Controllers.
	MOTORS :—
31	Field coils.
32	Armatures.
33	Commutators.
34	Bearings.
35	Gears, gear cases, and pinions.
36	Brushes and brush holders.
37	Miscellaneous.

GENERAL ACCOUNTS.

No. of Account		Title of Account
Repairs	Capital	
40	41	Electric water sprinklers.
42	43	Tower wagons.
44	45	Sundry vehicles.
46	47	Buildings (An account for each building).
46-A	—	Lease of buildings (An account for each lease).
60	61	Workshops' machinery and equipment.
62	63	Wooden cabins.
64	65	Furniture and fittings.
66	67	Ticket punches.
68	69	Conductors' bags.
70	—	Power station tools.
71	—	Tools for workshops.
72	—	Tools for car barns.
73	—	Rail cleaners' tools.
74	75	Stopping signs.
76	—	Sundry traffic accessories.
77	—	Permanent way, repairs.
—	78	Permanent way, additional.
79	—	Permanent way, renewals.
80	—	Permanent way tools.
81	—	General stores.
82	—	Cleaning cars.
83	—	Oiling and greasing cars.
84	—	Oil, waste, &c., for general purposes in workshops.
85	86	Sand drying plant.
87	—	Drying sand.

ELECTRICAL DEPARTMENT.

No. of Account			Title of Account
Repairs	Renewals	Capital	
90	—	—	Time in yard (overhead staff).
91	—	—	Inspection time (overhead staff).
92	93	94	Poles.
95	96	97	Section boxes.
98	99	100	Cables.
101	—	—	Cleaning cable boxes.
102	—	104	Overhead wires.
108	109	110	Telephone instruments.
111	112	113	Power station machinery and equipment — (Sub-Accounts according to nature of plant).
114	—	—	Power supplies.
115	116	117	Bonding rails.
118	119	120	Welding rails.
121	—	—	Tools and instruments for cables.
122	—	—	Tools for overhead equipment.
123	—	—	Tools for bonding rails.
124	—	—	Tools for castwelding rails.
125	—	—	Curve greasing.

Also Special Construction Accounts and Sub-Accounts as required.

Special accounts not covered in the list would be issued and added as required. The same account numbers obviously serve for both Wages and Material, which are, in any case, necessarily kept separate throughout.

These account numbers would be quoted in all Time Allocation Returns, Requisitions to Stores, &c. It is recommended that, in addition to the account number, the purpose or description of the work be stated. This not only affords a check on the account numbers, but serves for any more detailed analysis which may be required.

Time and material expended in Workshops on manufacturing would be charged to a double number—the first or upper number representing the Manufacturing Account, and the lower the number of the order or job number. These manufacturing costs would be debited in the individual Stock

Accounts for the respective items of material handed over to Stores when completed. The Stores Stock Accounts would thus be a complete record of the costs of all articles, whether purchased or manufactured.

A proper numerical list of accounts for the allocation of all time and material is not only of great utility for outside use as a clear basis to work from, saving untold error and confusion, but greatly facilitates the work of abstracting and tabulating in the Accountant's office.

CHAPTER IV.

ALLOCATION OF WAGES.

THE Time Allocation Returns (Forms 38, 48, 55, 68, and 71 in "Tramway Bookkeeping and Accounts") are substituted by Form A. In this form provision is made for two weeks' time instead of one, the total for each of the two weeks being shown for checking with Wages Sheets. The inclusion of two weeks' time in each man's return practically reduces the work of abstracting by one-half, without causing inconvenience in any other way. The allocation of wages should be done by other clerks than those entrusted with the payment of wages.

Form A is perforated in sections, so that, when separated, each section or strip will contain time chargeable only to one account. These strips would be classified and fastened together in lots or bundles, each lot comprising the strips of those employees of the same class or grade whose time is chargeable at the same rate to the same account number. The total number of hours for the two weeks for each bundle would be written on the front and copied into Wages Allocation Sheets similar to Form 39 in "Tramway Bookkeeping and Accounts." (This Wages Allocation Sheet is recommended to be used *loose* instead of in book form.) The total hours having been entered in the respective columns, the extensions would be made from a reckoner, all the calculations at each rate being completed in turn.

The account totals would be carried from the Wages Allocation Sheets to Tabulations (Form B), which would also include the weekly totals of the various grades of employees whose time is not subject to allocation against different account numbers, but is debited *in toto*. The columns in these abstracts would be summed up (in red) every four weeks and a complete allocated abstract (Form C) made out. This statement, as will be seen, would contain absolutely all analyses of wages required for the Four-weekly Expenditure Statement and for the general books, and the total would agree with that of the Cash Book entry for wages paid for the corresponding period. (It is not recommended, however, that these amounts should be journalised four-weekly; quarterly, or even half-yearly, should suffice.) The Tabulations (Form B)—which should not be made very large—are extremely convenient for reference and comparison as to the amounts spent under the different headings during the course of the year.

CHAPTER V.

ALLOCATION OF MATERIALS.

It is desirable, as far as possible, to keep all materials in the General Store and to charge them, when issued, direct to the ultimate accounts. This means having as few sub-stores as possible, and these only for a stock sufficient for a very short time in advance.

To begin with, instead of requisitions being made out to General Stores, and the Storekeeper then writing out Despatch Notes for everything issued (a considerable amount of work both to do and to check), one simple form is recommended—a *Combined Stores Requisition and Receipt* (Form D). This takes the place of Requisitions (Forms 33 and 35), and Despatch Note (Form 26), in "Tramway Bookkeeping and Accounts."

In the rare cases where the full quantity requisitioned is not to be, or cannot at the time be, supplied, the Storekeeper would alter (and initial) the figure to the reduced quantity actually despatched, and the receiver would sign accordingly. Where an item cannot be supplied because it is not in stock, the Storekeeper would delete it from the form, adding it to his Record of Unfulfilled Requisitions. When, later, he is able to supply the goods to an Unfulfilled Requisition he would himself write out a form of receipt (from a book in his possession for this purpose), making reference to the number of the form on which the item was originally requisitioned, and obtain signature of receiver as afterwards explained.

Form D would be in triplicate, although for workshops, if adjoining the General Stores, a duplicate form only is required. The original would be retained in the book, the other two copies being sent to the General Stores. The duplicate would accompany the goods from the Stores, and, after being checked by the receiver, would be signed by him and returned to the General Store. Its receipt there would be recorded on the other copy retained by the Storekeeper, and it would then be sent to the Accountant's office, where the clerks in charge of the Stores Stock Accounts would deal with it as described hereafter.

It is strongly recommended—

(1) That the Stores Stock Accounts should not be kept at the Store.

(2) That the clerks responsible for keeping the Stores Stock Accounts should also carry through all pricing and extending of stores, and prepare Stores Allocation and Balance Sheets.

The size of the Requisition-Receipt (Form D) would correspond with the spaces on the Stores Issues Sheets (Form E), on to which the signed receipts are pasted in numerical order for each department.

From these sheets the quantities would be posted to the "Issues" side of the Stores Stock Accounts (Form F), and, at the same time, prices and extensions filled in both Allocation Sheets and Stock Accounts.

It will be observed that Form F has money columns *Dr.* and *Cr.* The use of these prevents disagreement (due to differences in prices and extensions) between the sum of the balances of the Stores Stock Accounts and the balance of the Stores Account in the General Ledger, thus confining any difference which may occur to one of quantity between actual stock and book balance.

Instead of having Allocation columns in Form E, a separate form (G) is recommended, as involving less work and using less paper, for abstracting the Stores Issues in order to bring out the amount chargeable to each account. The account numbers at the head of these Abstract Sheets would be arranged so that the same column throughout would be devoted to a particular account number; and the totals of the respective columns would represent the amounts chargeable for the period—say four weeks—against the various account numbers in respect of stores issued.

Form H (a companion to Form D) is a Returns Despatch Note for accompanying material returned to General Stores, whether good or scrap. As in the case of the Requisition-Receipt Forms, these Returns Despatch Notes would be pasted on the spaces on Form E (which in this case would be headed "Stores Returns"), the items priced and extended when being posted to the *Dr.* of the Stock Accounts, and the amounts carried under each account number into Abstract G. (A separate account would be kept for each kind of scrap.)

The Purchases (quantities) would be posted to the Stock Accounts (F) from the Stores Receivals Sheets (Form 24 in "Tramway Bookkeeping and Accounts"), and the prices and amounts would be posted as soon as possible from the checked invoices. The Receivals Sheets and Abstract G form the basis of the Stores Allocation and Balance Sheet (Form I). This Balance Sheet would be made up (every four weeks) as follows:—At the beginning of the financial period the total of the Stock Sheet for General Stores would appear as the first item on the *Dr.* side. Then would follow the amounts of purchases received during the four weeks, and also the amounts of debits to General Stores for goods made in workshops and handed over to General Stores during the same period. (Time and material

expended on manufacturing would be charged to a Manufacturing Account from which the last-mentioned debits to General Stores would be transferred.)

It will be observed that on the credit side of the Stores Allocation and Balance Sheet there are *Dr.*, *Cr.*, and *Net* columns, the object being to deduct from the gross amounts in the *Dr.* column the amounts in the *Cr.* column for scrap or other returns to store (see previous page), thus bringing out the *Net Dr. amount against each account.* (This saves Journal and Ledger entries.)

The *Net* amounts on the "Issued" side of Form J would be carried to Tabulation Sheets similar to Form B. The totals of these Tabulation Sheets would be journalised quarterly or half-yearly, as in the case of wages.

The balance of the Stores Allocation and Balance Sheet should represent the value of the stock in hand, and should agree—

(*a*) With the balance of the General Stores Account in the General Ledger.

(*b*) With the aggregate of the balances of the Stores Stock Accounts (which should be abstracted quarterly for agreement with the Stores Allocation and Balance Sheet).

In the Stock Sheet (Form K) columns will be observed for showing the differences between the actual stock of each item and the stock as per the Stock Account. Provision having been made (as explained on p. 27) to prevent differences due to prices or extensions, these columns show, for each item, how any stock difference is made up, so that, if necessary, Journal entries may be made as between Stores Account and the specific Expense Accounts affected.

CHAPTER VI.

CONCLUSION.

WITH the system outlined in the preceding pages all-round agreement is ensured every four weeks. Balance time does not bring discrepancies between subsidiary and general books. The clerical work is less; the auditing work is less. There are fewer books and forms. And the results are better.

The fact of four-weekly agreement permits of *accurate* statements of expenditure and receipts being made up, so that the totals of the thirteen statements will correspond with the yearly figures as per the published accounts. As showing all that has contributed throughout the varying seasons to produce the year's results, and for the constant guidance of the management, these four-weekly statements of expenditure and receipts are all-important, if the best results are to be obtained.

The form of the four-weekly statement would naturally be that of the published accounts, with, however, a little additional detail, all wages and salaries being shown in a separate column from material and other expenditure, and a column "Average per Car Hour" introduced in addition to "Average per Car Mile." The "Car Hour" is the most convenient time unit, and is invaluable for a variety of purposes.

The following is a list of some special statistical items relating to service, traffic, and financial results, with explanations as to

how they are made up. A number of these, not provided for in the Standard Form of Accounts (p. 8), have a significance and value which, as they become better known, should cause them to be appreciated and brought into general use.

1 Car Miles (service).
2 Total Car Miles.
3 Number of Service Car Miles per annum per head of population.
4 Number of Service Car Miles per annum per mile of single track.
5 Total Car Miles per car per day (total equipment of cars).
6 Car Hours—
Sum of time in service of each car.
7 Car Miles per hour—
No. 2 divided by No. 6.

Note.—Obviously, to arrive at No. 7, No. 2 or No. 6 must not include anything the other does not.

8 Seat Miles.
No. 1 multiplied by average number of seats per car.
9 Passenger Miles (*travelled*).
The sum of the average distance (ascertained by special records) as *travelled* at each fare multiplied by the number of passengers at each fare.
10 Passenger Miles (*paid for*).
The sum of the average distance *given* at each fare multiplied by the number of passengers at each fare.
11 Average distance paid for.
No. 10 divided by total number of passengers.
12 Average distance travelled.
No. 9 divided by total number of passengers.
13 Average number of passengers in each car.
No. 9 divided by No. 1.

Note.—The figure commonly used, viz., "Passengers per Car Mile," being dependent entirely upon distance travelled, is apt to be misleading. Suppose 50 passengers are carried 4 miles by a car—none entering or leaving on the way—the result is only 12·5 passengers per car mile, and yet there were actually 50 passengers in the car throughout each of the 4 miles!

14 Percentage of seats occupied.
Per cent. of No. 9 to No. 8.

15 Number of Seat Miles per annum per mile of single track.
No. 8 divided by miles of track.

16 Number of Seat Miles per annum per head of population.
No. 8 divided by population.

17 Number of Passenger Miles travelled per annum per mile of single track.
No. 9 divided by miles of track.

18 Number of Passenger Miles travelled per annum per head of population.
No. 9 divided by population.

19 Miles of single track per 100,000 of population.

20 Miles of single track per square mile of area served.

21 Population per square mile of area served.

22 Receipts
- Per car mile.
- ,, car hour.
- ,, annum per mile of single track,
- ,, ,, per head of population.
- ,, passenger.
- ,, passenger per mile paid for.
  Receipts divided by No. 10.
- ,, passenger per mile travelled.
  Receipts divided by No. 9.

23 Average fare charged per mile.

24 Ton Miles.
No. 2 multiplied by average weight of cars (empty), plus weight of passengers, arrived at by multiplying passenger miles travelled (No. 9), by, say, 120 lbs.

Note.—Ton mile figures are useful in connection with consumpt of current and maintenance of permanent way.

25 Ton miles per annum per mile of single track.

26 Gross Balance (to Net Revenue Account)—Expenses *including* Power.
- Per car mile.
- ,, ,, hour,
- ,, passenger.
- ,, annum per mile of single track.
- ,, ,, ,, head of population.
- ,, cent. per annum to Capital Expenditure.

27 Same as 24, but Expenses *excluding* Power.

The foregoing list does not repeat certain items on page 8, which seem already to meet all requirements.

Now that electric traction has been in operation for some years, it is clear that most of the tramway systems owned and operated by local authorities ought to be able to make substantial contributions in relief of rates. It would certainly be unwise and unwarrantable to construct extensions so inconsiderately, to run so lavish a service, or to operate at such low fares, as to leave no possible margin after providing for contingencies. And, obviously, where a community is looking to its tramways undertaking to assist the rates, a desirable incentive is given and a proper obligation is imposed which should ensure the attainment of the best commercial results.

LIST OF FORMS, facsimiles of which are given on pages named.

		PAGE
A	Time Allocation Return	35
B	Tabulation of Allocated Wages	36
C	Four-Weekly Abstract of Allocated Wages	37
D	Combined Stores Requisition and Receipt	37
E	Stores Issues Sheet	38
F	Stores Stock Account	39
G	Allocation Abstract of Stores Issues Sheets	40
H	Returns Despatch Note	41
J	Stores Allocation and Balance Sheet	41
K	Stock Sheet	42

Also

Standard Form of Tramway Accounts	2-8
Numerical List of Accounts (for Allocation of Time and Material)	20-22

Form A.— TIME ALLOCATION RETURN.

Name..... .....Department.

Fortnight ending.....190..

CERTIFIED

	Account No.	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total Hours for Week	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total Hours for Week	Total Hours for Fort-night
No..... Rate ..... Occ'n.....																		
No..... Rate ..... Occ'n.....																		
No..... Rate ..... Occ'n.....																		
No..... Rate ..... Occ'n.....																		
No..... Rate ..... Occ'n.....																		
No..... Rate ..... Occ'n.....																		
No..... Rate ..... Occ'n.....																		
No..... Rate ..... Occ'n.....																		
No..... Rate ..... Occ'n.....																		
No..... Rate ..... Occ'n.....																		
Checked with Wages Sheet	Totals..																	

Form B.—

TABULATION OF ALLOCATED WAGES.—CAR MAINTENANCE.

Period		Department	Mechanical					Electrical			
From	To		Account 1	Account 2	Account 3		Total (A/cs 1-24)	Account 25	Account 26		Grand Total (A/cs 1-37)
			£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d	£ s d
						And so on up to Account 24 as per Numerical List of Accounts (pages).				And so on up to Account 37 as per Numerical List of Accounts (pages).	

Other groups of Accounts would be similarly tabulated.

Form C.—

ABSTRACT OF ALLOCATED WAGES for Four Weeks ending.....190..

Account No.	Title of Account	Amounts		
		£ s d	£ s d	£ s d
	The Account Nos. and Titles would be printed on this Form in numerical order, as in the List of Accounts (pages 20-23).			

Form D.— No.....

STORES REQUISITION AND RECEIPT.

To STOREKEEPER, GENERAL STORES.

Please supply.....Department with the undermentioned:—

Article No.	Article	No. or Quant'y	Weight	Received	Purpose	Account No.
			T. c. qr. lb.			
				Date received ..... Signature		

Approved by..... Requisitioned by.....

Date.....190..

Form E.—

STORES ISSUES SHEET.

	Stock A/c No.	Price	Amounts	
			£ s d	£ s d

Form F.— STORES STOCK ACCOUNT.

Unit.....

Stock to be kept { Maximum..... Minimum.....

Ordered		Received							Issued							Stocktaking Memo.				
Date	Quantity	Date	Invoice No.	Received from	No. or Quantity	Weight	Price	Amount	Date	Receipt No.	No. or Quantity	Weight	Price	Amount	Account No.	Date Stock taken	Stock	Balance of Account	Remarks
						T. c. q. lb.		£ s d				T. c. q. lb.		£ s d					

Form G.—

ALLOCATION ABSTRACT OF STORES ISSUED.....190..

A/c No.....				A/c No				A/c No.....				A/c No.....				A/c No.....				A/c No.....				A/c No.....				A/c No.....				A/c No.....			
No.	£	s	d	No.	£	s	d	No.	£	s	d	No.	£	s	d	No.	£	s	d	No.	£	s	d	No.	£	s	d	No.	£	s	d	No.	£	s	d

Form H.— No.....

RETURNS DESPATCH NOTE.

To STOREKEEPER, GENERAL STORES.

Please receive from.....Department the undermentioned and Credit Account named :—

Article No.	Article	No. or Quant'y	Weight				Received	Originally charged	
			T.	c.	qr.	lb.		Purpose	Account No.
							Date received ..... Signature		

Sent by..... Date.....190....

Form J.—

STORES ALLOCATION AND BALANCE SHEET

for four weeks ending.....190..

Received				Issued					Remarks
No. of Invoice	Name	Material	Amount	No. of Account	Title of Account	*Dr.*	*Cr.* (Returns to Store)	Net *Dr.*	
			£ s d			£ s d	£ s d	£ s d	
	To Balance—Stock " Purchases as under:— " Manufactured Goods received from Works				The Accounts would be entered here in numerical order as in List of Accounts pages 20-23.				
					By Balance—Stock				

Form K.— STOCK SHEET.

STOCK OF MATERIAL IN.....STORE ON.....190..

Article No.	Description	Stock Account No.	Unit	Stock taken		Stock as per Stock Account			Differences				Remarks
									Stock in excess of Account Balance		Stock under Account Balance		
				Quantity	£ s d	Quantity	Price	£ s d	Quantity	£ s d	Quantity	£ s d	

INDEX.

(*For Index to Forms, see page* 34.)

PAGE

Allocation of Wages—
- Weekly Time Allocation Returns 24, 35
- Weekly Wages, Allocation Sheets 24
- Tabulations for bringing out Four Weekly and Quarterly Figures 25

Appropriation Account 3

Balance (gross) on Basis of Various Units 32
- ,, Sheet (general) 6
- ,, ,, (Stores) 28-29

Capital Account 5
- ,, ,, Items Chargeable to 15-17

Distance (av.) Paid for and Travelled 31

Expenditure Ledgers, Disadvantages of 18-19

Fare (av.) Charged per Mile 32

Forms, List of 34
- ,, Facsimiles of 35-42

Four-Weekly Statement of Expenditure and Receipts 30

Manufacturing Account 22, 23, 29

Materials, Allocation of 26-29

Net Revenue Account 3

Numerical List of Accounts 20-23

Passenger and Passenger Mile Statistics 31-32

Population Statistics 21

Power Expenses, Abstract of 7

Receipts on Basis of Various Units 22

Relief of Rates, Contribution towards 33

Reserve or Renewals Fund Account 4

Returns Despatch Notes 28, 41

Revenue Account 2
- ,, ,, Items Chargeable to.. 9-14

PAGE

Seat Mile Statistics 31-32
Sinking Fund Account 4
Standard Form of Accounts—
Revenue Account 2
Net Revenue Account 3
Appropriation Account 3
Reserve or Renewals Fund Account 4
Sinking Fund Account 4
Capital Account 5
Balance Sheet 6
Abstract of Power Expenses 7
Statistical Information 8
Items Chargeable to Revenue Account 9-14
,, ,, ,, Capital Account 15-17

Stores—
Combined Stores Requisition and Receipt 26-27, 37
Unfulfilled Requisitions 26
Stores Issues Sheets 27, 38
,, Stock Accounts 27, 39
Preventing Differences between Stock Accounts and Stores Account in General Ledger 27
Abstracting Stores Issues to bring out Four-Weekly Figures .. 28, 40
Returns Despatch Notes (for Articles or Scrap returned to Stores) 28, 41
Stores Allocation and Balance Sheet 28, 29, 41
Manufacturing Account 22, 23, 29
Tabulations for bringing out Four-Weekly and Quarterly Figures 29
Agreeing Balance of Stores Allocation and Balance Sheet .. 29
Stock Sheet 29, 42
Differences between Actual Stock and Stock Account Balances 29

Wages, Allocation of—
Weekly Time Allocation Returns 24, 35
,, Wages Allocation Sheets 24
Tabulation of Allocated Wages 25, 36

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